Research Note

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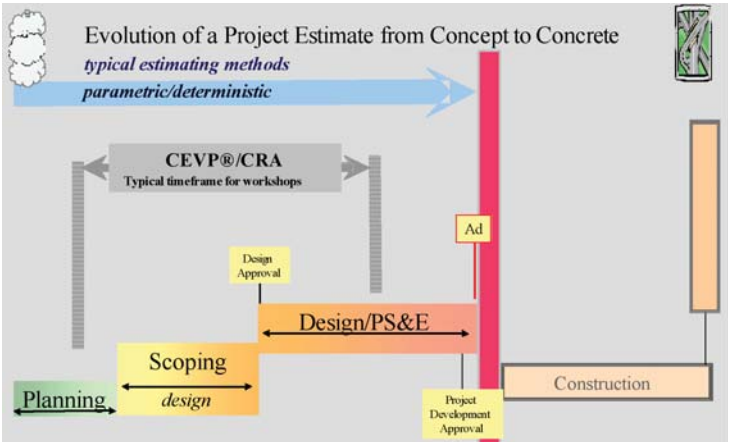
Washington State Department of Transportation



Project Scoping State of Practice: Washington State

The Problem: Underestimation of project costs and schedules can damage credibility

Scoping is used to identify a project's purpose and need, its characteristics, and its predicted schedule and estimated cost. The overall goal of this research project was to investigate ways to accurately scope projects using a process that aligns with the critical path development for programming and the legislative budget cycle. Inadequate scoping of a project often affects the project's schedule and budget and can mislead or give incomplete information to decision makers as they allocate project funding. We know from past experiences that projects with underestimated costs and schedules, especially for mega-projects, are problematic. They can become the basis for public distrust, lack of confidence in project implementers, and lack of interest for increased funding. These "over-budget" and "overdue" projects have generated considerable literature, studies, Web site activity, and media attention.

What we did: Drawing on others' research and experiences

The researchers did an extensive literature review on the subjects of scoping and cost escalation.

A broad survey and review of the activities and efforts of 14 states, usually by the Departments of Transportation in those states, augmented the literature review. Specific effort was made to determine how scoping was done, the extent of cost escalation and the strategies used to handle scoping cost escalation.

What We Learned:

- Cost estimation is a challenging component of the scoping process both in a budgeting and public trust context. Scoping starts early in the design process and the initial preliminary project estimates have too many unknowns for public release. Initial generalized project cost estimates become "hard numbers" in the minds of planners and the public. Such numbers are difficult to maintain and defend. One answer WSDOT found to questions about estimating project costs is the realization that an estimate is more accurately expressed, not as a single number, but as a range. To put this into practice, WSDOT developed the Cost Estimate Validation Process, CEVP®.

- This research affirmed the value of the Washington State Department of Transportation's estimating processes. The risk-based estimating processes CEVP® and Cost Risk Assessment [CRA]) developed by WSDOT are well accepted, and often recommended, in the review of literature and survey of states. Using this risk-based process, an estimate is not a price guarantee, but rather an assessment of probability of risk during stages of project design and construction. It allows the designers to see the "invisible" issues and look at potential problems early in the process that weren't considered in the past. An appropriate estimate range is better in the sense that it is bet-

ter to be approximately right, rather than precisely wrong.

- Public awareness is both a problem and a solution. Transparency of the WSDOT's scoping process will encourage accurate estimates in an ongoing fashion while fostering acceptance of those estimates and project characteristics. The Virginia Department of Transportation's public information program, the Dashboard Web site, gives the public an easy to use and understand tool to check on project status, and was a model mentioned favorably in the reviews and survey.

- Historical data are snapshots in the past of a changing market; and while historical data is useful, it must be augmented with additional knowledge and judgment. Cost estimates are prepared in "current year" dollars and then inflated to the "year of expenditure". It is important to report cost estimates in Year of Expenditure (YOE) numbers at all stages from planning to construction; and to document the method used to determine the YOE estimate. Inflation indices will guide the growth in costs; but no one can guarantee what the future will bring.

What the Researchers Recommend:

1. Consider increased funding for, and application of, CEVP® and CRA. Continued review of cost and schedule estimates should be done throughout project development. The cost savings and value of public transparency may offset any scope cost increases as a result of following these estimating practices. Such continuous monitoring will inform the project managers as well as citizens and political decision makers.

2. Consider monitoring the source of item errors in cost and schedule estimation and quantifying and measuring the performance of the cost estimation process.

3. Consider using risk-based estimation in a portfolio of projects for consideration by the Legislature. The total budget may be a "known and hard" figure, but internal variation in individual projects may be acceptable in a portfolio management of risk. This approach should involve consideration of "risk reserves" at the total state transportation budget level, rather than contingencies at the individual project level.

4. Continue to document the benefits of effective cost estimation and cost management. Benefits include:
   a. clearly established cost estimating practices (including documentation and reporting);
   b. enhanced in-house project cost estimating and management expertise;
   c. greater credibility with the public and other stakeholders;
   d. improved project delivery and program management;
   e. better use of available resources.

Summary of implementation:
The information gained from this research is useful in promoting an increased emphasis and placing a higher priority on estimating throughout project development. This research also affirms WSDOT's Risk-Based Estimating Practices (CEVP® and CRA) and endorses expanding its use. The survey obtained from other states is helpful in benchmarking WSDOT's program against other states to develop a best practice approach. The research serves as a communication tool for increasing the understanding and value of WSDOT's risk-based estimating processes.

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Researchers:
Dr. Ken Casavant
509.335.1608
casavantk@wsu.edu

Dr. Eric Jessup
509.335.5558
Eric_Jessup@wsu.edu

Mark Holmgren
School of Economic Sciences
Washington State University
Pullman, Washington 99164-6210

Technical Monitor:
Mark Gabel, P.E.
Cost Risk Assessment Office
360.705.7457
GabelM@wsdot.wa.gov

For More Information Contact:
Kathy Lindquist
Research Manager
WSDOT Research Office
360.705.7976
lindquk@wsdot.wa.gov